

CLAIMS

The invention claimed is:

1. A method of coloring an optical fiber, said method comprising:

5 applying a base color coating of a first curable material to an optical fiber core section, said base color coating having a base color;

10 applying at least one stripe of a second curable material to said base color coating before said base color coating is fully cured, said stripe having a stripe color different from said base color, and wherein said stripe is formed in said base color coating such that a diameter of said optical fiber remains substantially uniform; and
15 curing said base color coating and said stripe.

15 2. The method of claim 1 wherein applying said base color coating includes coating said optical fiber core section in a die and passing said coated optical fiber core section through an exit portion of said die having a longitudinal channel for controlling said diameter of said colored optical fiber.

20 3. The method of claim 2 wherein applying said stripe includes injecting said second curable material through an aperture in a side wall of said die.

25 4. The method of claim 1 further comprising partially curing said base color coating before applying said stripe.

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5. The method of claim 1 wherein applying said stripe includes injecting said second curable material against said base color coating using a nozzle.

5 6. The method of claim 5 further comprising partially curing said base color coating before applying said stripe using said nozzle.

10 7. The method of claim 6 further comprising passing said optical fiber core section having said base color coating and said stripe through another die to maintain a substantially uniform diameter.

15 8. The method of claim 6 wherein curing said base color coating and said stripe includes passing said base color coating and said stripe through a full cure station.

20 9. The method of claim 1 wherein applying said at least one stripe includes applying a plurality of stripes.

10. The method of claim 1 wherein said first curable material and said second curable material are UV-curable materials.

25 11. The method of claim 1 wherein said first curable material and said second curable material are different types of material.

30 12. A method of coloring an optical fiber, said method comprising:

applying a base color coating of a first curable material to an optical fiber core section to form a coated

optical fiber core section, said base color coating having a base color;

applying at least one stripe of a second curable material to said coated optical fiber core section, said stripe having a stripe color different from said base color;

controlling a thickness of said base color coating and said stripe such that a diameter of said colored optical fiber remains substantially uniform; and

curing said base color coating and said stripe.

13. The method of claim 12 wherein the steps of applying and controlling the thickness of said base color coating and said stripe include:

coating said optical fiber core section;

passing said coated optical fiber core section through a die having a longitudinal channel for controlling said diameter of said colored optical fiber; and

injecting said second curable material through an aperture in a side wall of said die.

14. The method of claim 13 wherein the step of curing said base color coating and said stripe includes curing said base color coating and said stripe simultaneously in a cure station.

15. The method of claim 12 wherein the step of curing said base color coating and said stripe includes:

partially curing said base color coating before applying said stripe; and

fully curing said base color coating and said stripe after applying said stripe.

16. The method of claim 15 wherein the steps of applying and controlling the thickness of said base color coating include:

5 coating said optical fiber core section; and
 passing said coated optical fiber core section through
a first die.

10 17. The method of claim 16 wherein the step of applying said stripe includes injecting said second curable material against said base color coating using a nozzle.

15 18. The method of claim 17 wherein the step of controlling the thickness of said base color coating and said stripe includes passing said colored optical fiber through a second die before the step of fully curing said base color coating and said stripe.

20 19. The method of claim 12 wherein the steps of applying and controlling the thickness of said base color coating and said stripe include:

 applying said base color coating using a first die;
 passing said coated optical fiber core section through said first die to provide a gap in said base color coating;

25 applying said stripe to said gap in said base color coating using a second die; and

 passing said coated optical fiber core section through said second die to maintain said substantially uniform diameter.

30 20. The method of claim 19 wherein the step of curing said base color coating and said stripe includes first

curing said base color coating after passing said coated optical fiber core section through said first die and then curing said stripe after passing said coated optical fiber core section through said second die

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21. A tandem coloring system for coloring an optical fiber, said system comprising:

a coloring die for receiving an optical fiber core section coated with a base color coating;

10 a semi-cure station, for partially curing said base color coating on said optical fiber core section after said optical fiber core section passes through said coloring die;

15 at least one striping nozzle, for applying a stripe to said base color coating on said optical fiber core section after said base color coating is partially cured at said semi-cure station; and

20 a full cure station for fully curing said base color coating and said stripe after said stripe is applied by said striping nozzle.

22. The system of claim 21 further comprising another die located between said striping nozzle and said full cure station for maintaining a substantially uniform diameter.

25 23. The system of claim 21 further comprising a plurality of striping nozzles.

30 24. The system of claim 21 wherein said at least one striping nozzle includes an ink jet head.

25. A tandem coloring system for coloring an optical fiber, said system comprising:

a first coloring die for receiving an optical fiber core section coated with a base color coating, wherein said 5 first coloring die forms a gap in said base color coating;

a first cure station for curing said base color coating on said optical fiber core section after said optical fiber core section passes through said first coloring die;

10 a second coloring die for applying a stripe to said gap in said base color coating on said optical fiber core section after said base color coating is cured at said first station; and

15 a second cure station for curing said stripe after said stripe is applied by said second coloring die.

26. A coloring die for coloring an optical fiber, said coloring die comprising:

a main portion for receiving an optical fiber core 20 section coated with a base color coating;

an exit portion extending from said main portion, said exit portion defining a substantially straight longitudinal passageway having a substantially uniform diameter, for maintaining said optical fiber at a substantially uniform 25 diameter; and

at least one striping tube coupled to said exit portion for injecting a stripe through a side aperture in said exit portion, whereby said stripe is applied to said base color coating and maintained at said substantially 30 uniform diameter.

27. The coloring die of claim 26 further including a plurality of striping tubes coupled to said exit portion for injecting stripes through a plurality of side apertures in said exit portion.

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28. A colored optical fiber comprising:
an optical fiber core section;
at least one base color coating over said optical fiber core section, said base color coating having a base color; and
at least one stripe formed in said base color coating, said stripe having a stripe color different from said base color, wherein an overall diameter of said colored optical fiber is substantially uniform.

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